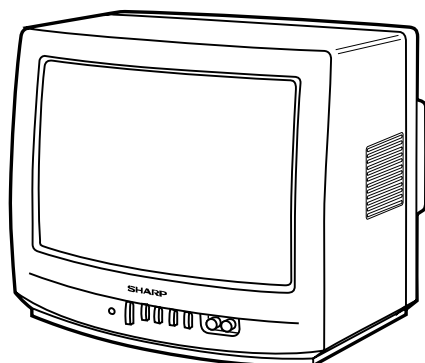


SHARP SERVICE MANUAL

SX0K513N-M100



COLOR TELEVISION

Chassis No. SN-010

MODELS 13N-M100B/150B CN13M10B

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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ELECTRICAL SPECIFICATIONS

POWER INPUT	120 V AC 60 Hz
POWER RATING	53 W
PICTURE SIZE	580cm ² (89.8sq inch)
CONVERGENCE	Magnetic
SWEEP DEFLECTION	Magnetic
FOCUS	Hi-Bi-Potential Electrostatic
INTERMEDIATE FREQUENCIES	
Picture IF Carrier Frequency	45.75 MHz
Sound IF Carrier Frequency	41.25 MHz
Color Sub-Carrier Frequency	42.17 MHz
	(Nominal)
AUDIO POWER	
OUTPUT RATING	0.9W (at 10% distortion)

SPEAKER	
SIZE	8 cm (Round)
VOICE COIL IMPEDANCE	32 ohm at 400 Hz
ANTENNA INPUT IMPEDANCE	
VHF/UHF	75 ohm Unbalanced
TUNING RANGES	
VHF-Channels	2 thru 13
UHF-Channels	14 thru 69
CATV Channels	1 thru 125
	(EIA, Channel Plan U.S.A.)

Specifications are subject to change without prior notice.

SHARP CORPORATION

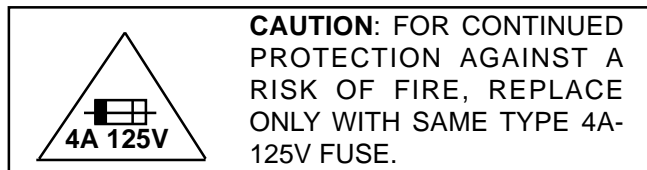
This document has been published to be used for after sales service only.
The contents are subject to change without notice.

IMPORTANT SERVICE SAFETY PRECAUTION

- **Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:**

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.
3. Semiconductor heat sinks are potential shock hazards when the chassis is operating.
4. The chassis in this receiver has two ground systems which are separated by insulating material. The non-isolated (hot) ground system is for the B+ voltage regulator circuit and the horizontal output circuit. The isolated ground system is for the low B+ DC voltages and the secondary circuit of the high voltage transformer.
To prevent electrical shock use an isolation transformer between the line cord and power receptacle, when servicing this chassis.



SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove the static charge by connecting a 10k ohm resistor in series with an insulated wire (such as a test probe) between the picture tube ground and the anode lead. (AC line cord should be disconnected from AC outlet.)

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage anode completely.

X-RADIATION AND HIGH VOLTAGE LIMITS

1. Be sure all service personnel are aware of the procedures and instructions covering X-radiation. The only potential source of X-ray in current solid state TV receivers is the picture tube. However, the picture tube does not emit measurable X-Ray radiation, if the high voltage is as specified in the "High Voltage Check" instructions.
It is only when high voltage is excessive that X-radiation is capable of penetrating the shell of the picture tube including the lead in the glass material. The important precaution is to keep the high voltage below the maximum level specified.
2. It is essential that servicemen have available at all times an accurate high voltage meter.
The calibration of this meter should be checked periodically.
3. High voltage should always be kept at the rated value –no higher. Operation at higher voltages may cause a failure of the picture tube or high voltage circuitry and;also, under certain conditions, may produce radiation in exceeding of desirable levels.
4. When the high voltage regulator is operating properly there is no possibility of an X-radiation problem. Every time a color chassis is serviced, the brightness should be tested while monitoring the high voltage with a meter to be certain that the high voltage does not exceed the specified value and that it is regulating correctly.
5. Do not use a picture tube other than that specified or make unrecommended circuit modifications to the high voltage circuitry.
6. When trouble shooting and taking test measurements on a receiver with excessive high voltage, avoid being unnecessarily close to the receiver.
Do not operate the receiver longer than is necessary to locate the cause of excessive voltage.

IMPORTANT SERVICE SAFETY PRECAUTION

(Continued)

BEFORE RETURNING THE RECEIVER

(Fire & Shock Hazard)

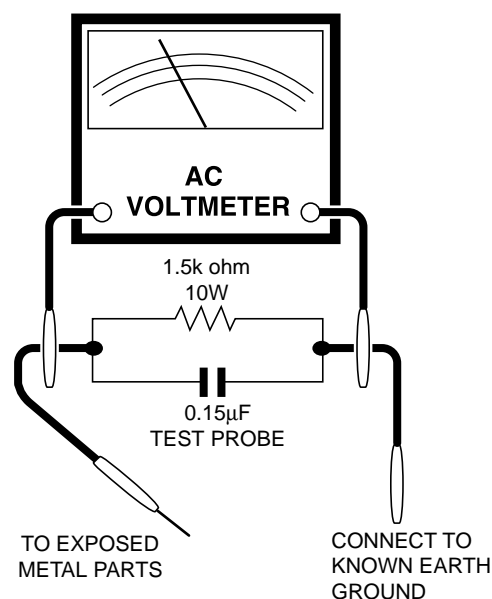
Before returning the receiver to the user, perform the following safety checks.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators and etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.
 - Plug the AC cord directly into a 120 volt AC outlet, (Do not use an isolation transformer for this test).
 - Using two clip leads, connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15 μ F capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to earth ground.
 - Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity to measure the AC voltage drop across the resistor.

- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon and etc.) and measure the AC voltage drop across the resistor.

All checks must be repeated with the AC line cord plug connection reversed. (If necessary, a non-polarized adapter plug must be used only for the purpose of completing these check.)

Any current measured must not exceed 0.5 milliamp. Any measurements not within the limits outlined above indicate of a potential shock hazard and corrective action must be taken before returning the instrument to the customer.



SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety-related characteristics. These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" and shaded areas in the Replacement Parts Lists and Schematic Diagrams.

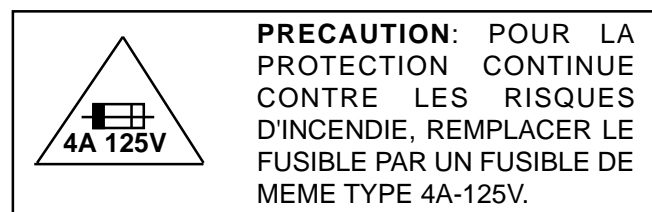
For continued protection, replacement parts must be identical to those used in the original circuit. The use of substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire, X-radiation or other hazards.

PRECAUTIONS A PRENDRE LORS DE LA REPARATION

- **Ne peut effectuer la réparation qu' un technicien spécialisé qui s'est parfaitement accoutumé à toute vérification de sécurité et aux conseils suivants.**

AVERTISSEMENT

1. N'entreprendre aucune modification de tout circuit. C'est dangereux.
2. Débrancher le récepteur avant toute réparation.
3. Les déversoirs thermiques à semi-conducteurs peuvent présenter un danger de choc électrique lorsque le récepteur est en marche.
4. Le châssis de ce récepteur possède deux systèmes de masse qui sont séparées par du matériel d'isolation. Le système de masse non-isolée (sous tension) est pour le circuit du régulateur de tension B+ et le circuit de sortie horizontale. Le système de masse isolée est pour les tensions DC B+ basses et le circuit secondaire du transformateur haute tension. Pour éviter tout risque d'électrocution lors de l'entretien de ce châssis, utiliser un transformateur d'isolation entre le cordon de ligne et la prise de courant.



REPARATION DU SYSTEME A HAUTE TENSION ET DU TUBE-IMAGE

Lors de la réparation de ce système, supprimer la charge statique en branchant une résistance de 10 kΩ en série avec un fil isolé (comme une sonde d'essai) entre la mise à la terre du tube-image et le fil d'anode. (Le cordon d'alimentation doit être retiré de la prise murale.)

1. Le tube image dans ce récepteur emploie une protection intégrée contre l'implosion.
2. Par mesure de sécurité, changer le tube-image pour un tube du même numéro de type.
3. Ne pas lever le tube-image par son col.
4. Ne manipuler le tube-image qu'en portant des lunettes incassables et qu'après avoir déchargé totalement la haute tension.

LIMITES DES RADIATIONS X ET DE LA HAUTE TENSION

1. Tout le personnel réparateur doit être instruit des instructions et procédés relatifs aux radiations X. Le tube-image, seule source de rayons X dans les téléviseurs transistorisés, n'émet pourtant pas de rayons mesurables si la haute tension est maintenue à un niveau préconisé dans la section "Vérification de la haute tension". C'est seulement quand la haute tension est excessive que les rayons X peuvent entrer dans l'enveloppe du tube-image y compris le conducteur de verre. Il est important de maintenir la haute tension en-dessous du niveau spécifié.
2. Il est essentiel que le réparateur ait sous la main un voltmètre à haute tension qui doit être périodiquement étalonné.
3. La haute tension doit toujours être maintenue à la valeur de régime -et pas plus haute. L'opération à des tensions plus élevées peut entraîner une panne du tube-image ou du circuit à haute tension et, dans certaines conditions, peut entraîner une radiation dépassant les niveaux prescrits.
4. Quand le régulateur à haute tension fonctionne correctement, il n'y a aucun problème de radiation X. Chaque fois qu'un châssis couleurs est réparé, la luminosité doit être examinée tout en contrôlant la haute tension à l'aide d'un voltmètre pour s'assurer que la haute tension ne dépasse pas la valeur spécifiée et qu'elle soit correctement réglée.
5. Ne pas utiliser un tube-image autre que celui spécifié et ne pas effectuer de modifications déconseillées du circuit à haute tension.
6. Lors de la recherche des pannes et des mesures d'essai sur un récepteur qui présente une haute tension excessive, éviter de s'approcher inutilement du récepteur.
Ne pas faire fonctionner le récepteur plus longtemps que nécessaire pour localiser la cause de la tension excessive.

PRECAUTIONS A PRENDRE LORS DE LA REPARATION

(Suite)

VERIFICATIONS CONTRE L'INCEN-DIE ET LE CHOC ELECTRIQUE

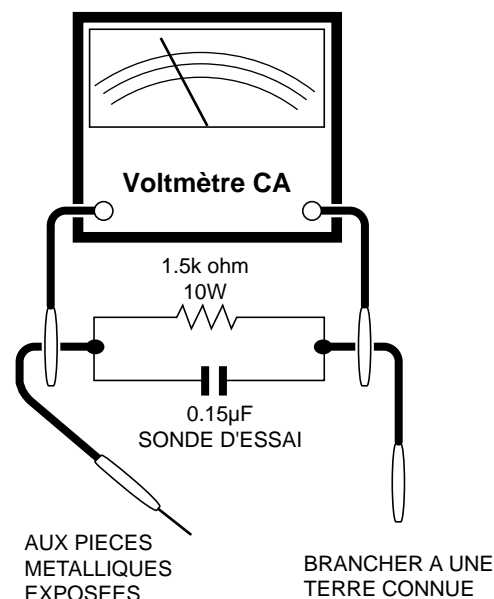
Avant de rendre le récepteur à l'utilisateur, effectuer les vérifications suivantes.

1. Inspecter tous les faisceaux de câbles pour s'assurer que les fils ne soient pas pincés ou qu'un outil ne soit pas placé entre le châssis et les autres pièces métalliques du récepteur.
2. Inspecter tous les dispositifs de protection comme les boutons de commande non-métalliques, les isolants, le dos du coffret, les couvercles ou blindages de réglage et de compartiment, les réseaux de résistance-capacité, les isolateurs mécaniques, etc.
3. S'assurer qu'il n'y ait pas de danger d'électrocution en vérifiant la fuite de courant, de la façon suivante:
 - Brancher le cordon d'alimentation directement à une prise de courant de 120V. (Ne pas utiliser de transformateur d'isolation pour cet essai).
 - A l'aide de deux fils à pinces, brancher une résistance de 1,5 k Ω 10 watts en parallèle avec un condensateur de 0,15 μ F en série avec toutes les pièces métalliques exposées du coffret et une terre connue comme une conduite électrique ou une prise de terre branchée à la terre.
 - Utiliser un voltmètre CA d'une sensibilité d'au moins 5000 Ω /V pour mesurer la chute de tension en travers de la résistance.

- Toucher avec la sonde d'essai les pièces métalliques exposées qui présentent une voie de retour au châssis (antenne, coffret métallique, tête des vis, arbres de commande et des boutons, écusson, etc.) et mesurer la chute de tension CA en-travers de la résistance. Toutes les vérifications doivent être refaites après avoir inversé la fiche du cordon d'alimentation. (Si nécessaire, une prise d'adpatation non polarisée peut être utilisée dans le but de terminer ces vérifications.)

Tous les courants mesurés ne doivent pas dépasser 0,5 mA.


Dans le cas contraire, il y a une possibilité de choc électrique qui doit être supprimée avant de rendre le récepteur au client.



AVIS POUR LA SECURITE

De nombreuses pièces, électriques et mécaniques, dans les téléviseurs présentent des caractéristiques spéciales relatives à la sécurité, qui ne sont souvent pas évidentes à vue. Le degré de protection ne peut pas être nécessairement augmentée en utilisant des pièces de remplacement étalonnées pour haute tension, puissance, etc.

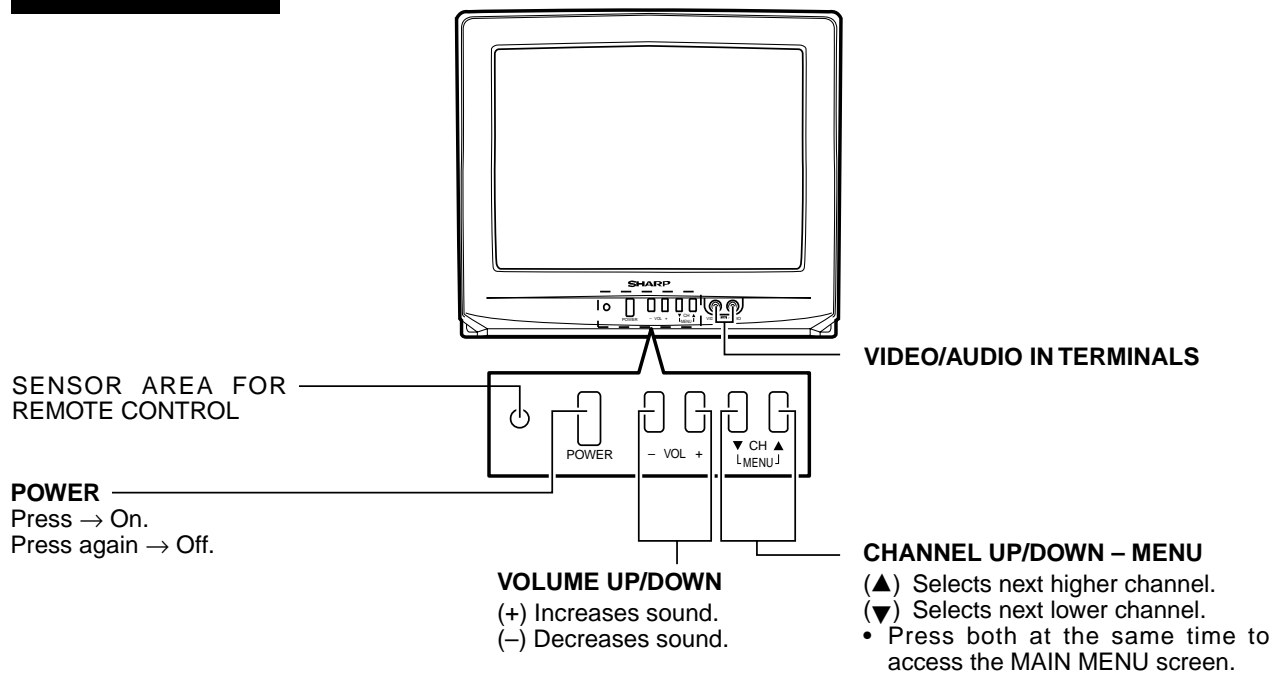
Les pièces de remplacement qui présentent ces caractéristiques sont identifiées dans ce manuel; les pièces électriques qui présentent ces particularités sont

identifiées par la marque "  " et hachurées dans la liste des pièces de remplacement et les diagrammes schématiques.

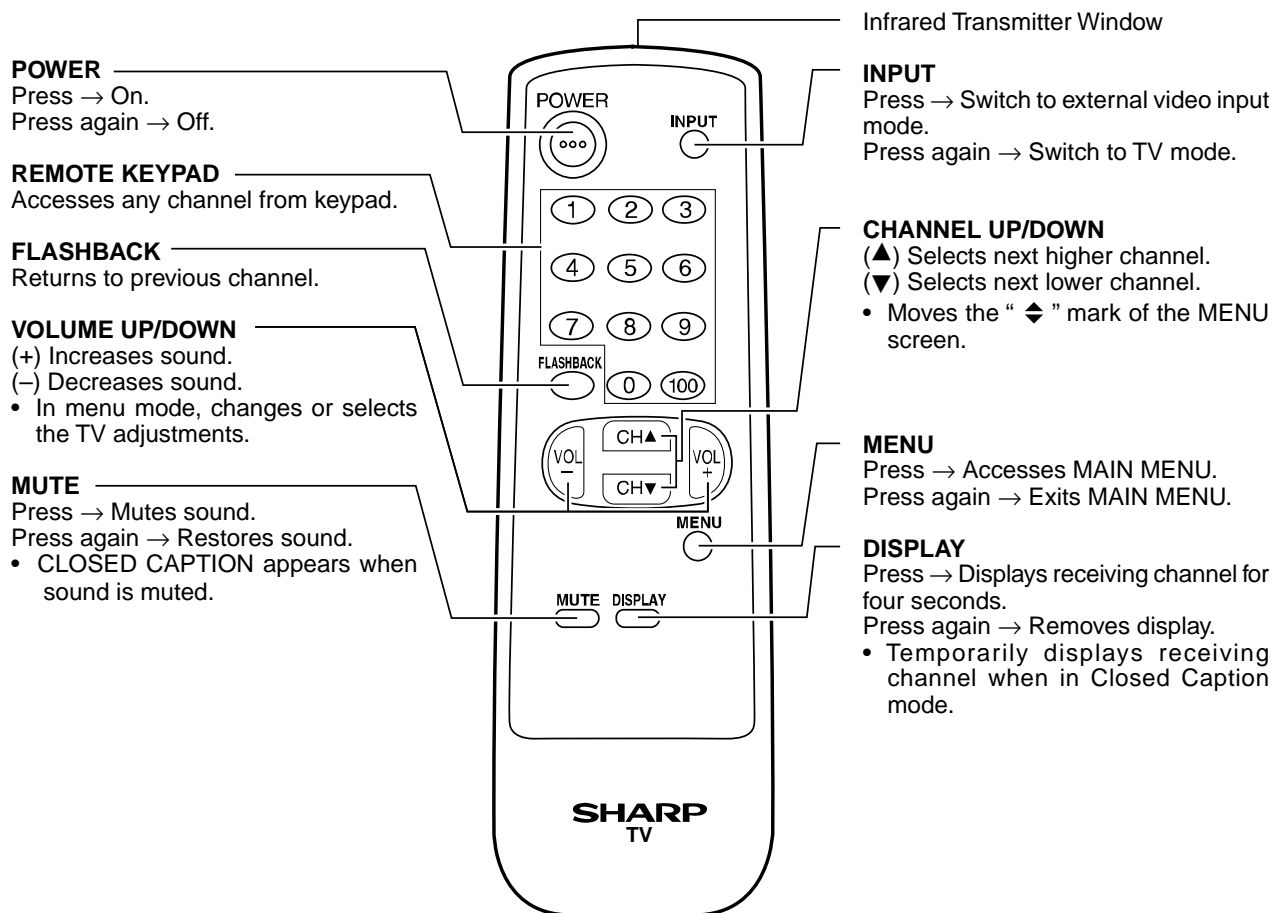
Pour assurer la protection, ces pièces doivent être identiques à celles utilisées dans le circuit d'origine. L'utilisation de pièces qui n'ont pas les mêmes caractéristiques que les pièces recommandées par l'usine, indiquées dans ce manuel, peut provoquer des électrocutions, incendies, radiations X ou autres accidents.

LOCATION OF USER'S CONTROL

Front Panel



Basic Remote Control Functions



INSTALLATION AND SERVICE INSTRUCTIONS

Note: (1) When performing any adjustments to resistor controls and transformers use non-metallic screwdrivers or TV alignment tools.
(2) Before performing adjustments, the TV set must be on at least 15 minutes.

CIRCUIT PROTECTION

The receiver is protected by a 4.0A fuse (F701), mounted on PWB-A, wired into one side of the AC line input.

X-RADIATION PROTECTOR CIRCUIT TEST

After service has been performed on the horizontal deflection system, high voltage system, B+ system, test the X-Radiation protection circuit to ascertain proper operation as follows:

1. Apply 120V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Receive a good local channel.
4. Connect a digital voltmeter to TP653 and make sure that the voltmeter reads $21.1 \pm 1.5V$.
5. Apply external 27.9V DC at TP653 by using an external DC supply, TV must be shut off.
6. To reset the protector, unplug the AC cord and make a short circuit between TP651 and TP652. Now make sure that normal picture appears on the screen.
7. If the operation of the horizontal oscillator does not stop in step 5, the circuit must be repaired before the set is returned to the customer.

HIGH VOLTAGE CHECK

High voltage is not adjustable but must be checked to verify that the receiver is operating within safe and efficient design limitations as specified checks should be as follows:

1. Connect an accurate high voltage meter between ground and anode of picture tube.
2. Operate receiver for at least 15 minutes at 120V AC line voltage, with a strong air signal or a properly tuned in test signal.
3. Enter the service mode and select the service adjustment "S03" and Bus data "01" (Y-mute on).
4. The voltage should be approximately, 24.0kV (at zero beam).

If a correct reading cannot be obtained, check circuitry for malfunctioning components. After the voltage test, make Y-mute off to the normal mode.

For adjustments of this model, the bus data is converted to various analog signals by the D/A converter circuit.

Note: There are still a few analog adjustments in this series such as focus and master screen voltage. Follow the steps below whenever the service adjustment is required.

To enter the service mode and exit service mode.

While pressing the Vol-up and Ch-up buttons at the sametime, plug the AC cord into a wall socket.

Now, the TV set is switched on and enters the service mode.

To exit the service mode, turn the television off by pressing the power button.

1. Service mode.

Before putting unit into the service mode, check that customer adjustments are in the normal mode. Use the reset function in the video adjustment menu to ensure customer control are in their proper (reset) position.

2. Service number selection.

In the service mode, you will see the window screen as window ①. There are 3 adjustment categories ②DEF, ③SIGNAL, ④FIX VALUE as show in **Figure A**.

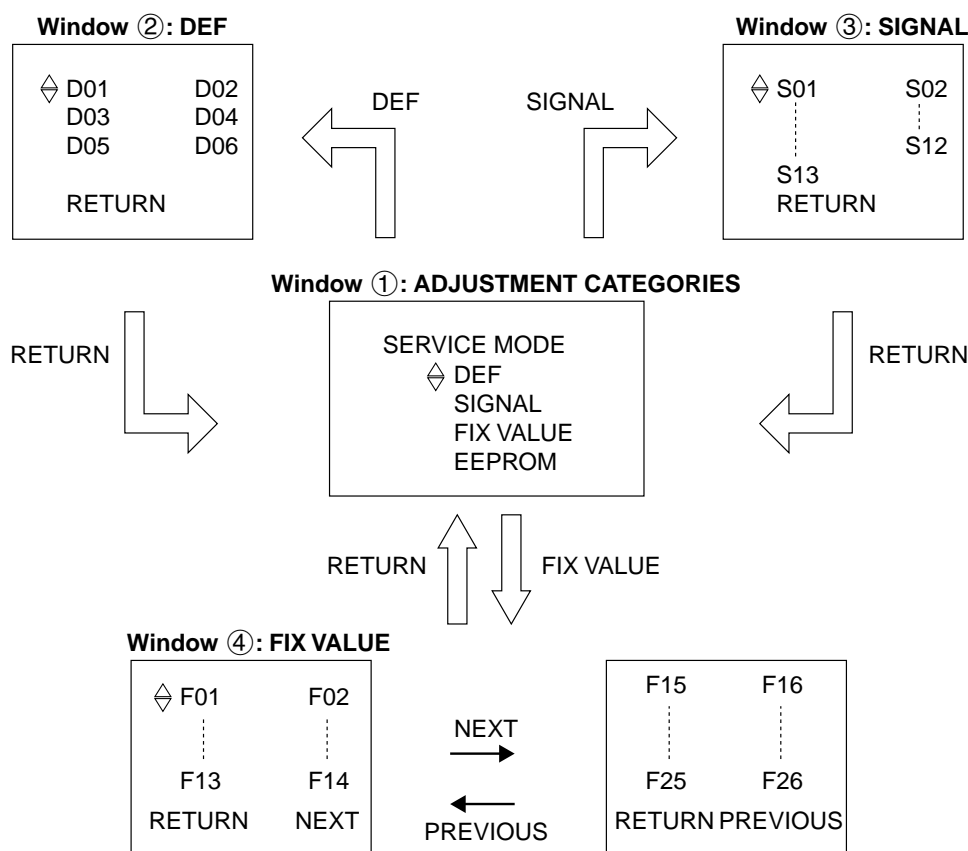


Figure A: ADJUSTMENT CATEGORIES

Press CH UP/DOWN button for selection and enter by VOL UP or VOL DOWN.

Press CH UP/DOWN button to select the adjustment item and VOL UP/DOWN to adjust the data number for each categories.

(OSD disturbance can be erased by R/C display key)

(Note: EEPROM-factory used only)

Below are the adjustments ranges and initial values for FIX VALUE category.

FIX VALUE

SERVICE POSITION	ADJUST ITEM	DATA		
		RANGE	INITIAL VALUE	(Hex)
F01	OPTION 1	00-FF	B0	*
F02	OPTION 2	00-FF	04	04
F03	E-SAVE	00-3F	23	2A
F04	TUNER SETUP	00, 01	00	00
F05	R-TONE RD	00-7F	19	03
F06	R-TONE BD	00-7F	00	7C
F07	B-TONE RD	00-7F	00	00
F08	B-TONE BD	00-7F	12	04
F09	FM LEVEL	00-1F	0C	0C
F10	AFC GAIN	00, 01	00	00
F11	G DRIVE	00, 0F	00	0F
F12	FBT BLK SW	00,01	01	01
F13	V COMP	00-07	07	07
F14	OSD CONT	00-03	02	01
F15	SHARPNESS	00-3F	19	19
F16	FLT SYS	00-07	00	00
F17	KILLER OP	00-07	04	02
F18	PRE SHOOT	00-03	03	00
F19	CORING	00-03	04	04
F20	DC REST	00-03	02	02
F21	BS START	00-03	01	01
F22	BS GAIN	00-03	01	01
F23	ABL START	00-07	00	00
F24	R/B ANGLE	00-0F	08	08
F25	H BLK R	00-0F	04	03
F26	H BLK L	00-0F	04	06

* Must be "B0" for 13N-M100B/150B, "A0" for CN13M10B

Table - A

Below are the ranges and initial values for each adjustment and in each categories.

DEF

SERVICE POSITION	ADJUST ITEM	DATA		ADJUSTMENT CONTENTS
		RANGE	INITIAL VALUE	
D01	H-PHASE	00-1F	0C	
D02	V-SIZE	00-7F	40	
D03	V-POSITION	00-3F	20	Must be "20"
D04	CC-POSITION	00-FF	1A	
D05	V-LINEARITY	00-1F	10	Must be "12"
D06	V-S-CORRECTION	00-1F	10	Must be "0F"

Table - B

SIGNAL

SERVICE POSITION	ADJUST ITEM	DATA		ADJUSTMENT CONTENTS
		RANGE	INITIAL VALUE	
S01	RF AGC	00-3F	14	
S02	VIDEO LEVEL	00-07	03	
S03	Y-MUTE	00-03	00	"01": Y-MUTE, "02": V-STOP & Y-MUTE "03": Activate color killer circuit.
S04	SUB BIAS	00-FF	40	Must be "60"
S05	R-BIAS	00-FF	00	
S06	G-BIAS	00-FF	00	
S07	B-BIAS	00-7F	00	
S08	R-DRIVE	00-7F	40	
S09	B-DRIVE	00-7F	40	
S10	CONTRAST	00-7F	5A	
S11	TINT	00-7F	40	
S12	COLOR	00-7F	40	
S13	BRIGHTNESS	00-7F	40	

Note: Refer to the SERVICE ADJUSTMENT for each corresponding values.

Table - C

Holding down both the Vol-up/Ch-down buttons on the TV set at service mode for more than 2 seconds will automatically write the above initial values into IC2101.

PART REPLACED	ADJUSTMENT		NOTES
	NECESSARY	UNNECESSARY	
IC2001		X	Data is stored in IC2101.
IC201	X		The adjustment is needed to compensate for characteristics of parts including IC201.
IC2101	X		Holding down both the Vol-up/Ch-down buttons on the TV set in the service mode for more than 2 seconds will automatically write the above initial values into IC2101.
CRT	X		Adjust items related to picture tube only.

Table - D

■ SERVICE ADJUSTMENT

Note: Before making the service adjustment, make the bus data settings.

+B Adjustment

1. Receive a good local channel.
2. Select VIDEO ADJUSTMENT RESET on the menu to get the video reset.
3. Connect a DC voltmeter between the +B line (at SW transformer) of R611 and the ground terminal.
4. Adjust R738 so that the voltmeter should read $130 \pm 0.5V$.

RF AGC Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "S01".
3. Set the data value to point where no noise or beat appears.
4. Select another channel to confirm that no noise or beat appears.

Note: You have to exit the service mode first to select another channel.

Video Level (TV Det Video Level) Adjustment

1. Receive a good local channel.
2. Enter the service mode signal category and select the service adjustment "S02".
3. Set the data value to "02" first, then adjust the data in ranges 02 ± 2 step to obtain a normal contrast level.

Screen adjustment

1. Connect to oscilloscope probe between TP855 and ground of the CRT unit.
2. Receive a good local channel.
3. Enter the service mode Signal category and set the service adjustment "S04" to step 60. Then select the service adjustment "S12" and set the data value to "00" to set the color level to the minimum level. (record the original data first). You may skip this step, if you selected a B/W picture or monoscope pattern. Set also the "S05/S06/S07" data to minimum level.
4. Select the service adjustment "S03" and set the data value to "01" to turn off the luminance signal (Y-mute).
5. Select the service adjustment "S13" and adjust the data value to obtain 2.40 volts as shown in **Figure B**.

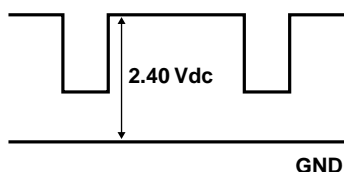


Figure B: WAVEFORM FOR SCREEN ADJUSTMENT

6. Adjust the master screen control until the raster darkens to the point where raster is barely seen.
7. Adjust the service adjustment "S05" red, "S06" green, "S07" blue to obtain a good grey scale with normal white at low brightness level.
8. Select the service adjustment "S03" and reset data to "00". Select the service adjustment "S12" and reset data to obtain normal color level.
9. Remove probe and reset the master screen control to obtain normal brightness range.

White Balance Adjustment.

1. Receive a good local channel.
2. Select the service adjustment "S12" and set the data value to "00" to set the color level to the minimum. You may skip this step, if you selected a B/W picture or monoscope.
3. Alternately adjust the service adjustment data of "S08" and "S09" until a good grey scale with normal white is obtained.
4. Select the service adjustment "S12" and reset data to obtain normal color level.

Sub-Picture Adjustment

1. Receive a good local channel.
2. Make sure the customer picture control is set to maximum.
3. Enter the service mode and select the service adjustment "S10".
4. Adjust the data value to achieve normal contrast range.

Sub-Tint Adjustment

1. Receive a good local channel.
2. Set the customer tint control to the center of its range.
3. Enter the service mode and select the service adjustment "S11".
4. Adjust "S11" data value to obtain normal fresh tones.

Sub-Color Adjustment

1. Receive a good local channel.
2. Make sure the customer color control is set to center position.
3. Enter the service mode and select the service adjustment "S12".
4. Adjust "S12" data value to obtain normal color level.

Sub-Brightness Adjustment

1. Receive a good local channel.
2. Make sure the customer brightness control is set to center position.
3. Enter the service mode and select the service adjustment "S13".
4. Adjust "S13" data value to obtain normal brightness level.

Vertical-Size, V-Linearity, V-S Correction Adjustment

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D02" for Vertical Size, "D05" for V-Linearity and "D06" for V-S Correction Adjustment.
3. Set in order "D05" for V-Linearity, "D06" for V-S Correction and set the data to get the best linearity.
4. Then adjust "D02" data until it become a proper vertical size.

Horizontal Position Adjustment

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D01".
3. Adjust "D01" data value to center the picture.

Vertical-Phase Adjustment

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D03".
3. Adjust "D03" bus data to get the most acceptable vertical position.

Note: The step range is 20 ± 10 .

Caption Position Adjustment (Horizontal)

1. Receive a good local channel.
2. Enter the service mode DEF category and select the adjustment "D04".
3. A black text box will appear on the screen. (see **Figure C.** below)
4. Adjust "D04" data value to balance the text box position in the center. ($A=B$).

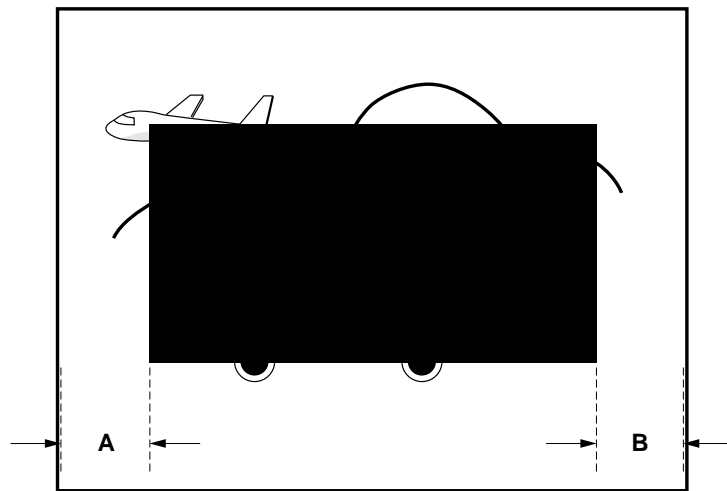
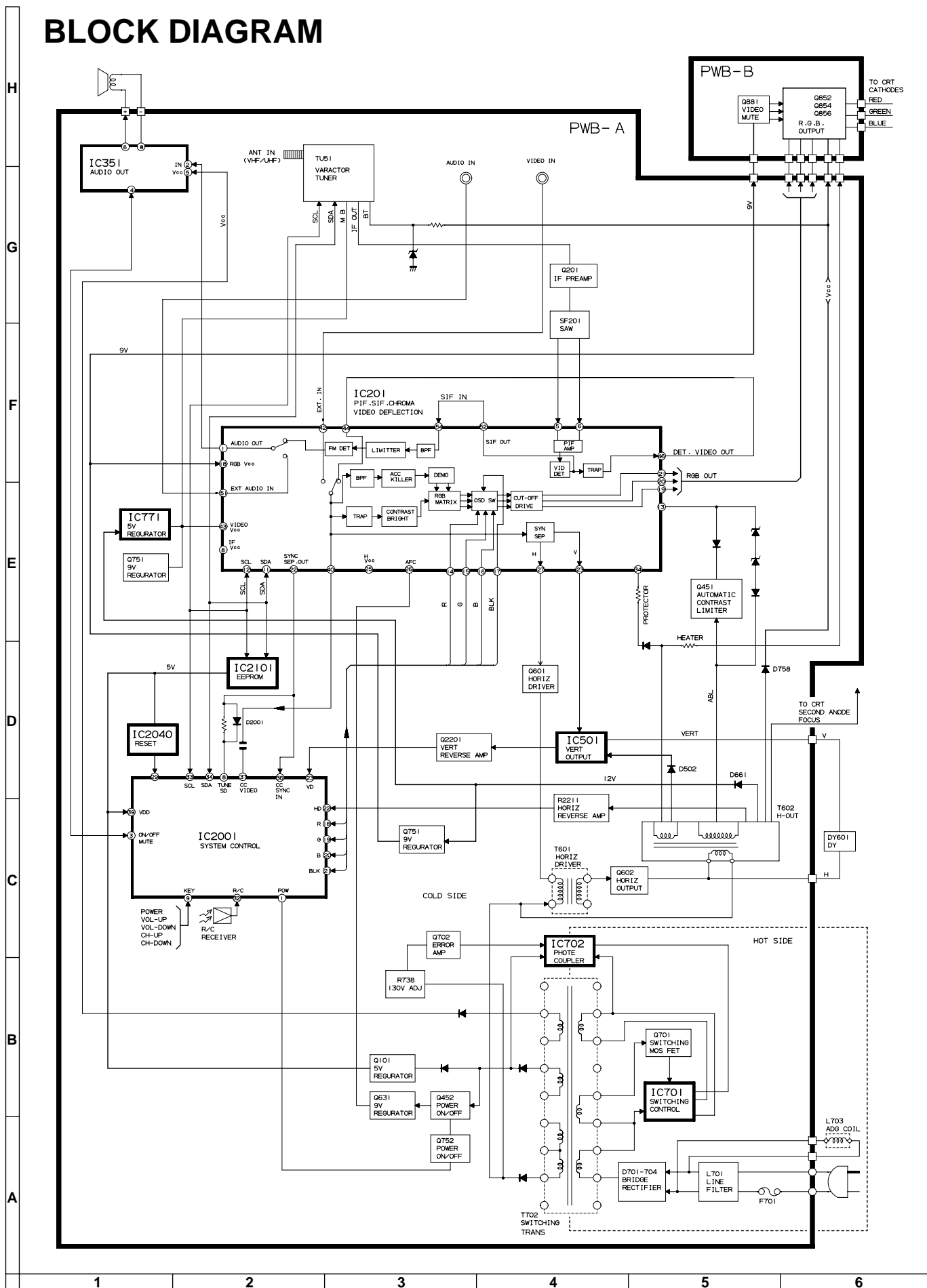


Figure C.



BLOCK DIAGRAM



DESCRIPTION OF SCHEMATIC DIAGRAM

NOTES:


1. The unit of resistance "ohm" is omitted.
($K=k\Omega=1000\Omega$, $M=M\Omega$)
2. All resistors are 1/10 watt, unless otherwise noted.
3. All capacitors are μF , unless otherwise noted.
($P=pF=\mu\mu F$)
4. (G) indicates $\pm 2\%$ tolerance may be used.
5. $\overline{\text{---}}$ indicates line isolated ground.

VOLTAGE MEASUREMENT CONDITIONS:

1. All DC voltages are measured with DVM connected between points indicated and chassis ground, line voltage set at 120V AC and all controls set for normal picture unless otherwise indicated.
2. All voltages measured with $1000\mu V$ B & W or Color signal.

WAVEFORM MEASUREMENT CONDITIONS:

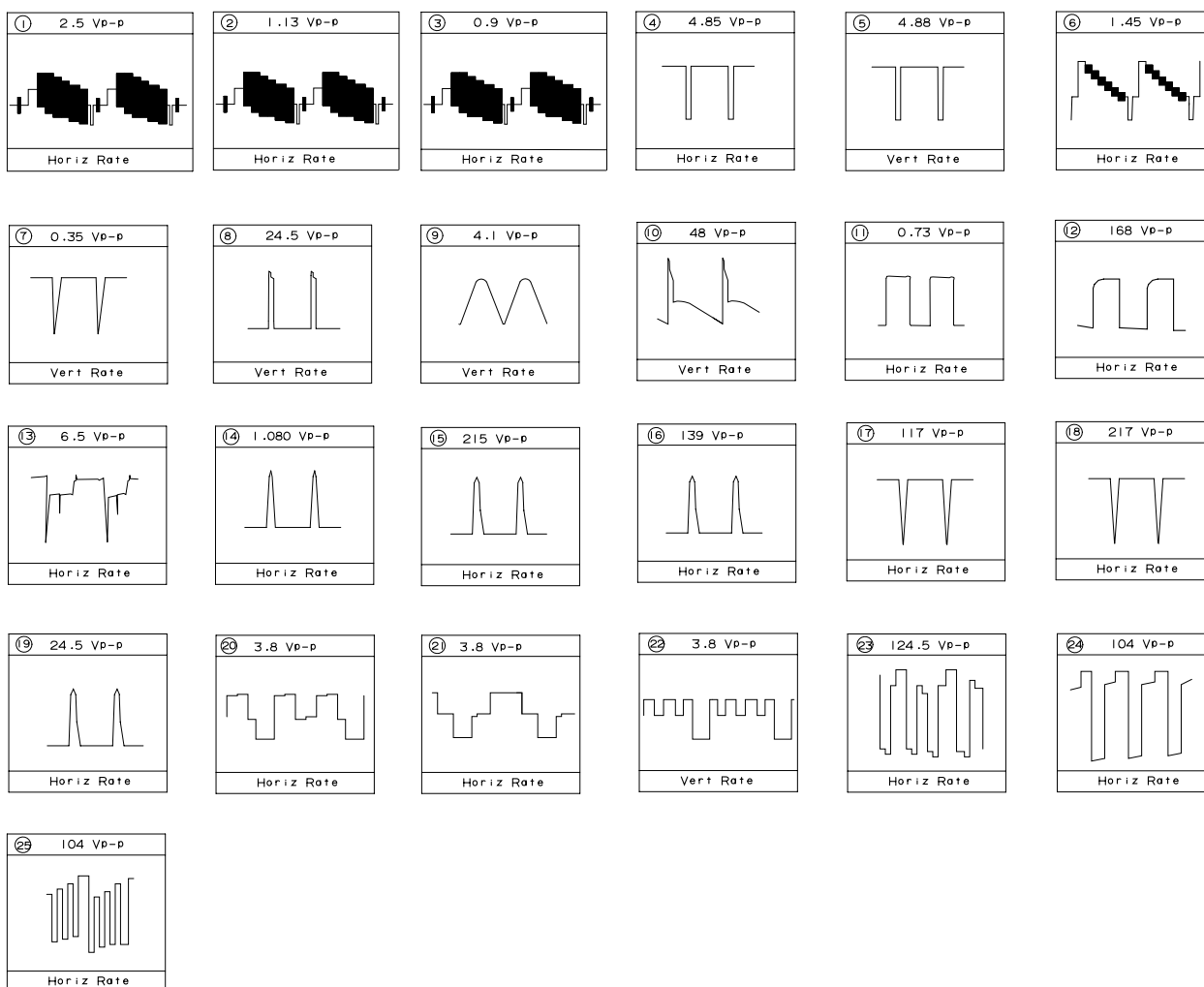
1. Photographs taken on a standard gated color bar signal, the tint setting adjusted for proper color. The wave shapes at the red, green and blue cathodes of the picture tube depend on the tint, color level and picture control.
2. \odot indicates waveform check points (See chart, waveforms are measured from point indicated to chassis ground.)

\triangle AND SHADED () COMPONENTS
= SAFETY RELATED PARTS.
 \blacktriangle MARK= X-RAY RELATED PARTS.

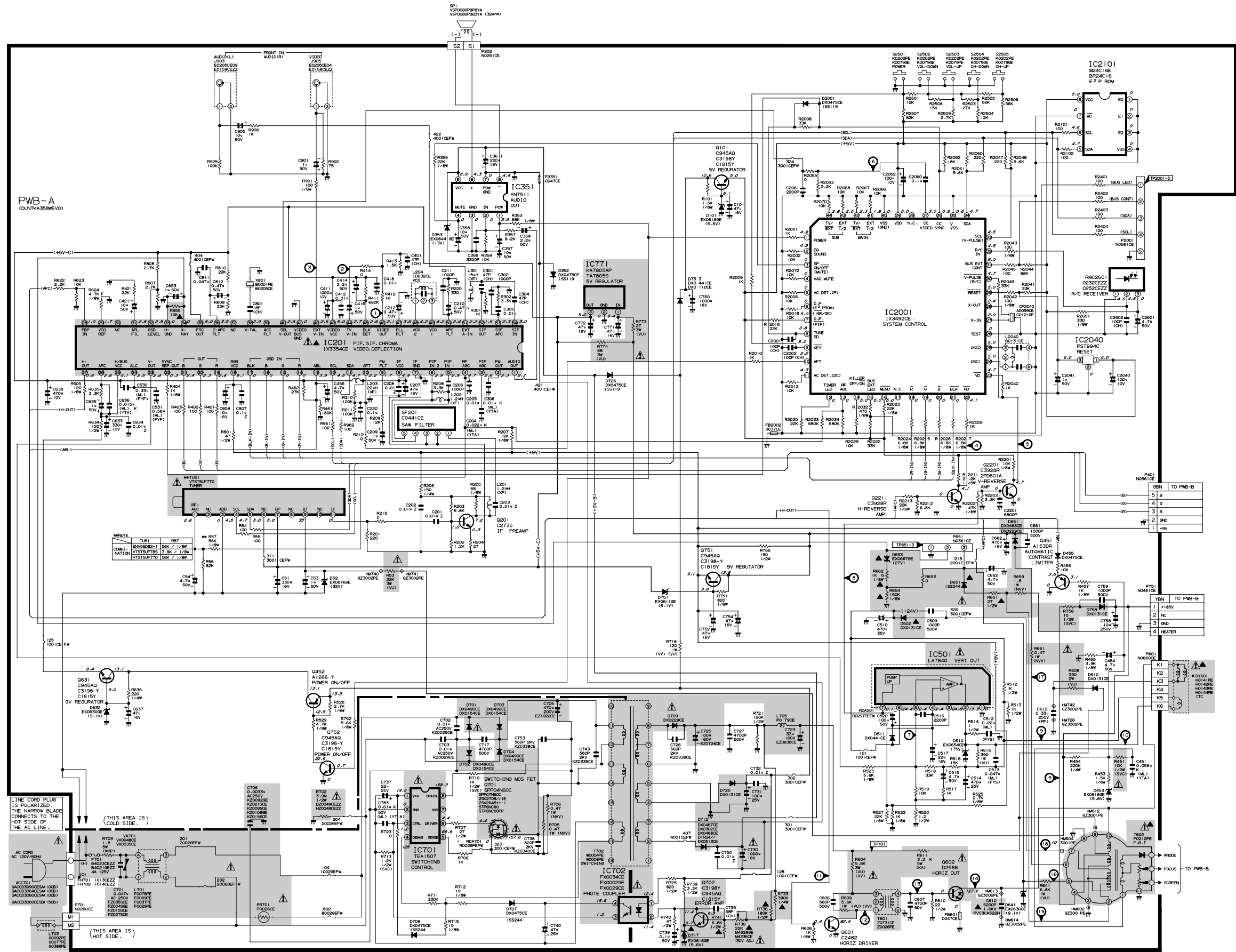
DRGANNES MARQUES \triangle ET HACHRES ():
PIECES RELATIVES A LA SECURITE.
MARQUE \blacktriangle : PIECS RELATIVE AUX RAYONS X.

This circuit diagram is a standard one, printed circuits may be subject to change for product improvement without prior notice.

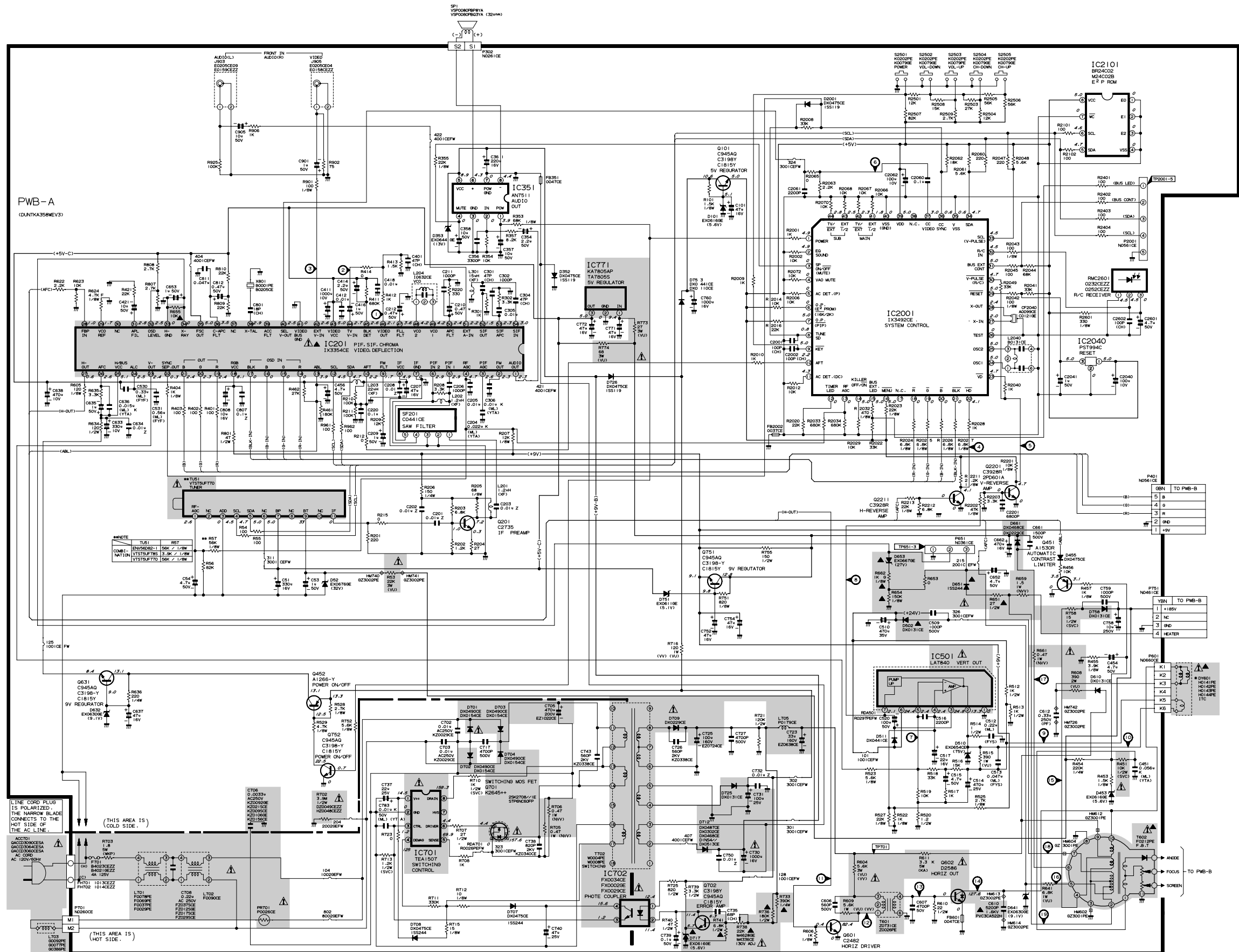
WAVEFORMS



MODELS 13N-M100B/150B SCHEMATIC DIAGRAM: MAIN Unit



MODEL CN13M10B SCHEMATIC DIAGRAM: MAIN Unit



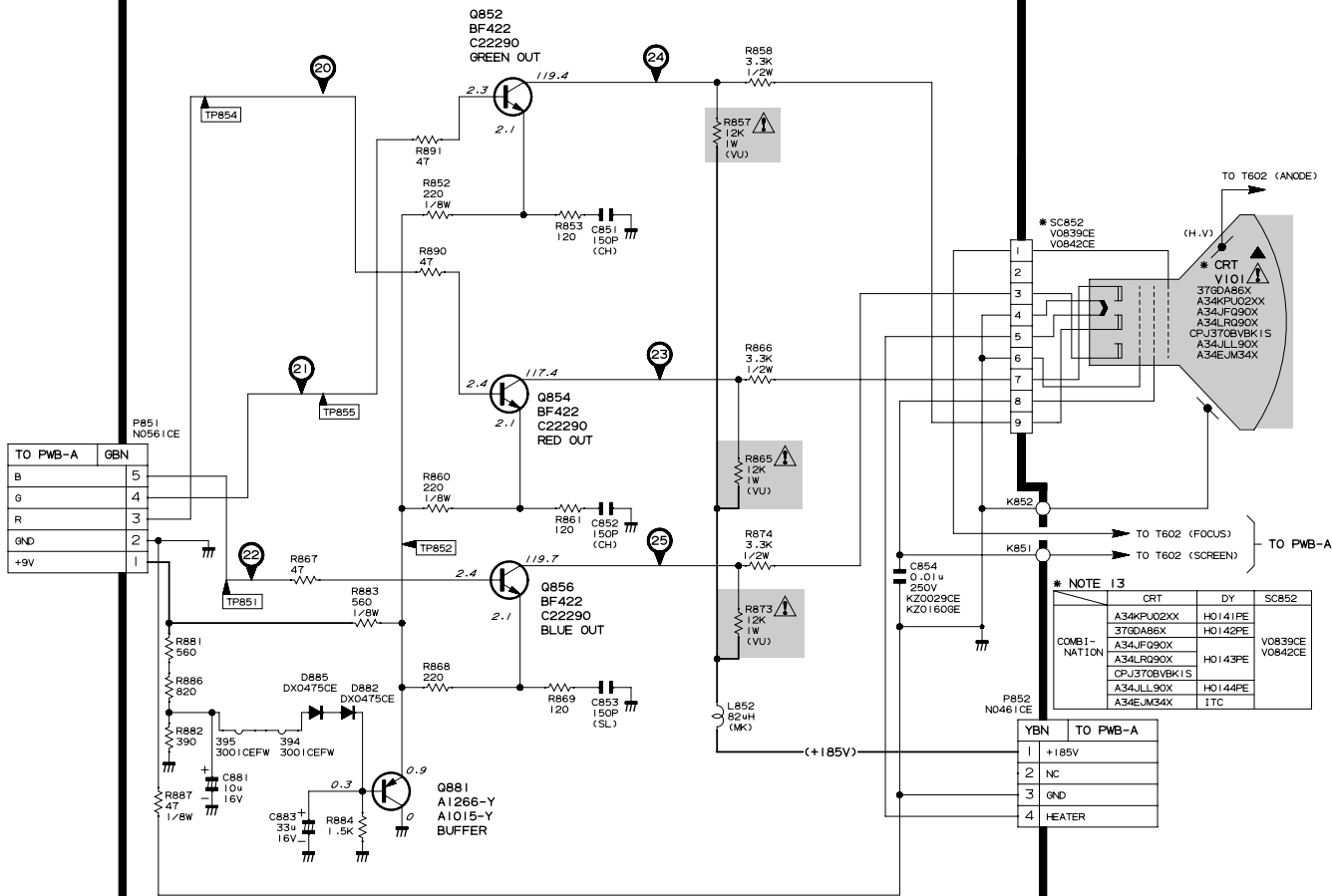
SCHEMATIC DIAGRAM: CRT Unit

REPLACE WITH A PICTURE
TUBE OF THE SAME TYPE
NUMBER FOR CONTINUED
SAFETY.

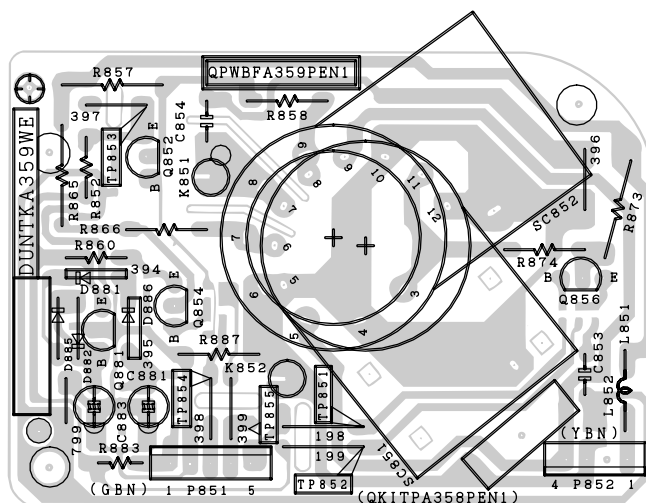
22.5KV (AT 820 μ A)

PWB-B

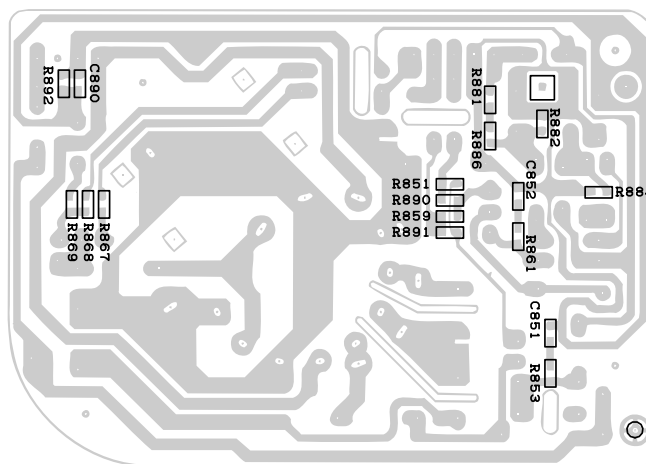
(DUNTKA359MEV0) ... 13N-M100B/150B
(DUNTKA359MEV3) ... CN13M10B



PRINTED WIRING BOARD ASSEMBLIES



PWB-B: CRT Unit (Wiring Side)



PWB-B: CRT Unit (Chip Parts Side)





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PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics identified in this manual; electrical components having such features are identified by Δ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristic as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following information.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. NO. |
| 3. PART NO. | 4. DESCRIPTION |

in **USA**: Contact your nearest SHARP Parts Distributor to order. For location of SHARP Parts Distributor, Please call Toll-Free; 1-800-BE-SHARP

★ MARK: SPARE PARTS-DELIVERY SECTION

▲ MARK: X- RAY RELATED PARTS

Ref. No.	Part No.	★	Description	Code
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PICTURE TUBE

▲ Δ V101	VB37GDA86X/1E	R	CRT (DY601: H0142PE)	CB
	or			
	VB34KPU02X/*S		CRT (DY601: H0141PE)	
	or			
	VB34JFQ90X/*S		CRT (DY601: H0143PE)	
	or			
▲ Δ DY601	VB34LRQ90X/*S		CRT (DY601: H0143PE)	
	or			
	VB370BVBK1S-S		CRT (DY601: H0143PE)	
	or			
	VB34JLL90X/*S		CRT (DY601: H0144PE)	
	or			
▲ Δ DY601	VB34EJM34X/1E		CRT (I.T.C.)	
	RCiLH0142PEZZ	R	DY (CRT: 37GDA86X)	AZ
	or			
	RCiLH0141PEZZ		DY (CRT: A34KPU02XX)	
	or			
	RCiLH0143PEZZ		DY (CRT: CPJ370BVBK1S or A34JFQ90X or A34LRQ90X)	
▲ Δ L703	or			
	RCiLH0144PEZZ		DY (CRT: A34JLL90X)	
	or			
	RCiLG0092PEZZ	R	Degaussing Coil	AK
	or			
	RCiLG0077PEZZ			
▲ Δ L703	or			
	RCiLG0386PEZZ			
	PMAGF3045CEZZ	R	Purity Magnet	AG
	or			
	QEARC1436PEZZ	R	Grounding Strap	AE

	CRT	DY	SC852
COMB1-NATION	A34KPU02XX	H0141PE	
	37GDA86X	H0142PE	
	A34JFQ90X		V0839CE
	A34LRQ90X	H0143PE	V0842CE
	CPJ370BVBK1S		
	A34JLL90X	H0144PE	
COMB1-NATION	A34EJM34X	ITC	

LISTE DES PIECES

CHANGE DES PIECES

Les pièces de rechange qui présentent ces caractéristiques spéciales de sécurité, sont identifiées dans ce manuel : les pièces électriques qui présentent ces particularités, sont repérées par la marque Δ et sont hachurées dans les listes de pièces et dans les diagrammes schématiques.

La substitution d'une pièce de rechange par une autre qui ne présente pas les mêmes caractéristiques de sécurité que la pièce recommandée par l'usine et dans ce manuel de service, peut provoquer une électrocution, un incendie ou tout autre sinistre.

"COMMENT COMMANDER LES PIECES DE RECHANGE"

Pour que votre commande soit rapidement et correctement remplie, veuillez fournir les renseignements suivants.

- | | |
|---------------------|----------------|
| 1. NUMERO DU MODELE | 2. NO. DE REF |
| 3. NO. DE PIECE | 4. DESCRIPTION |

in **CANADA**: Contact SHARP Electronics of Canada Limited
Phone (416) 890-2100

★MARQUE: SECTION LIVRAISON DES PIECES DE RECHANGE

▲ MARQUE: PIECES RELATIVE AUX RAYONS X

Ref. No.	Part No.	★	Description	Code
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PRINTED WIRING BOARD ASSEMBLIES (NOT REPLACEMENT ITEM)

PWB-A DUNTKA358WEV0	—	MAIN Unit (13N-M100B/150B)	—
PWB-A DUNTKA358WEV3	—	MAIN Unit (CN13M10B)	—
PWB-B DUNTKA359WEV0	—	CRT Unit (13N-M100B/150B)	—
PWB-B DUNTKA359WEV3	—	CRT Unit (CN13M10B)	—

PWB-A: DUNTKA358WEV0 (13N-M100B/150B) PWB-A: DUNTKA358WEV3 (CN13M10B) MAIN UNIT

TUNER

NOTE: THE PARTS HERE SHOWN ARE SUPPLIED AS AN ASSEMBLY BUT NOT INDEPENDENTLY.

▲ Δ TU51	VTUVTST5UF770	J Tuner	AZ
	or		
	VTUVTST5UF78S		
	or		
	VTUENV56D82-1		

	TU51	R57
COMB1-NATION	ENV56D82-1	56K / 1/8W
	VTST5UF78S	3.9K / 1/8W
	VTST5UF770	56K / 1/8W

INTEGRATED CIRCUITS

▲ Δ IC201	RH-iX3354CEZZ	J LX3354CE	AT
▲ Δ IC351	VHiAN7511/-1	J AN7511	AK
▲ Δ IC501	VHiLA7840/-1	J LA7840	AR
▲ Δ IC701	VHiTEA1507/-1	J TEA1507P/N1	AL
▲ Δ IC702	RH-FX0034CEZZ	J PC817	AE
	or		
	RH-FX0002GEZZ		
	or		
	RH-FX0029CEZZ		

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA358WEV0 (13N-M100B/150B)					D453	RH-EX0616GEZZ	J	Zener Diode, 5.6V	AA
PWB-A: DUNTKA358WEV3 (CN13M10B)					D455	RH-DX0475CEZZ	J	Diode	AB
MAIN UNIT (Continued)					▲ ▲ D502	RH-DX0131CEZZ	J	Diode	AC
▲ IC771	VHiKA7805AP-1	J	KIA7805API	AE	D510	RH-EX0654CEZZ	J	Zener Diode, 75V	AD
	or				D511	RH-DX0441CEZZ	J	Diode	AC
	VHiTA7805S/-1				D610	RH-DX0131CEZZ	J	Diode	AC
IC2001	RH-iX3492CEZZQ	J	IX3492CE	AU	D632	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA
IC2040	VHiPST994C/-1	J	PST994C	AD	D641	RH-EX0630GEZZ	J	Zener Diode, 9.1V	AA
IC2101	VHiBR24C02/-1	J	I.C. (CN13M10B)	AL	▲ ▲ D651	VHD1SS244/-1	J	Diode	AB
	or				▲ ▲ D653	RH-EX0667GEZZ	J	Zener Diode, 27V	AA
	VHiM24C02B/-1				▲ D661	RH-DX0468CEZZ	J	Diode	AE
IC2101	VHiM24C16B/-1	J	M24C16-BN6	AG		or			
	or		(13N-M100B/150B)		▲ D701	RH-DX0490CEZZ	J	Diode	AC
	VHiBR24C16/-1					or			
TRANSISTORS					▲ D702	RH-DX0154CEZZ	J	Diode	AC
Q101	VS2SC945AQ/-1	J	2SC945AQ	AB		or			
	or				▲ D703	RH-DX0490CEZZ	J	Diode	AC
	VS2SC3198-Y-1					or			
	VS2SC1815Y/-1				▲ D704	RH-DX0154CEZZ	J	Diode	AC
Q201	VS2SC2735//1E	J	2SC2735	AC		or			
Q451	VS2SA1530R/-1	J	2SA1530R	AB		RH-DX0490CEZZ	J	Diode	AC
Q452	VS2SA1266-Y-1	J	2SA1266(Y)	AA		or			
Q601	VS2SC2482//1	J	2SC2482	AD	D707	RH-DX0154CEZZ	J	Diode	AB
▲ Q602	VS2SD2586//1E	J	2SD2586	AM		or			
Q631	VS2SC945AQ/-1	J	2SC945AQ	AB	D708	VHD1SS244/-1	J	Diode	AB
	or					or			
	VS2SC3198-Y-1					VHD1SS244/-1			
	or				▲ D709	RH-DX0229CEZZ	J	Diode	AF
▲ Q701	VS2SK2645++-1	J	K2645++ (CN13M10B)	AN	▲ D712	RH-DX0487CEZZ	J	Diode	AC
	or					or			
	VS2SK2708//1E					RH-DX0302CEZZ			
	or					or			
	VSSTP6NC60F-1					RH-DX0468CEZZ			
▲ Q701	VSSPP04N60C-1	J	SPP04N60 (13N-M100B/150B)	AH		or			
	or					VHDD1NS4///-1			
	VSSPP07N60C-1					or			
	or					RH-DX0513CEZZ			
	VS2SK2708//1E				▲ ▲ D717	RH-EX0616GEZZ	J	Zener Diode, 5.6V	AA
	or				▲ D725	RH-DX0131CEZZ	J	Diode	AC
	VS2SK2645++-1				D726	RH-DX0475CEZZ	J	Diode	AB
	or					or			
	VSSTP6NC60++-1					VHD1SS119//1			
	or				D751	RH-EX0611GEZZ	J	Zener Diode, 5.1V	AA
	VSSTP6NC60F-1				D753	RH-DX0441CEZZ	J	Diode	AC
▲ Q702	VS2SC945AQ/-1	J	2SC945AQ	AB		or			
	or					RH-DX0110CEZZ			
	VS2SC3198-Y-1				▲ D758	RH-DX0131CEZZ	J	Diode	AC
	or				D2001	RH-DX0475CEZZ	J	Diode	AB
	VS2SC1815Y/-1					or			
Q751	VS2SC945AQ/-1	J	2SC945AQ	AB		VHD1SS119//1			
	or				▲ VA701	RH-VX0048CEZZ	J	Varistor (13N-M100B/150B)	AE
	VS2SC3198-Y-1					or			
	or					RH-VX0035CEZZ			
	VS2SC1815Y/-1				PACKAGED CIRCUITS				
Q752	VS2SC945AQ/-1	J	2SC945AQ	AB	▲ PR701	RMPTP0026CEZZ	J	Packaged Circuit	AF
	or				X801	RCRSB0001PEZZ	R	Crystal	AL
	VS2SC3198-Y-1					or			
	or					RCRSB0205CEZZ			
	VS2SC1815Y/-1				FILTERS				
Q2201	VS2SC3928R/-1	J	2SC3928R	AB	CF2040	RFiLA0099CEZZ	J	Ceramic Filter	AE
	or					or			
	VS2PD601AR/-1					RFiLC0121GEZZ			
Q2211	VS2SC3928R/-1	J	2SC3928R	AB	SF201	RFiLC0441CEZZ	J	SAW Filter	AH
DIODES					COILS				
D52	RH-EX0676GEZZ	J	Zener Diode, 32V	AA	L201	VP-XF1R2K0000	J	Peaking 1.2μH	AB
D101	RH-EX0616GEZZ	J	Zener Diode, 5.6V	AA	L202	VP-XF1R2K0000	J	Peaking 1.2μH	AB
D352	RH-DX0475CEZZ	J	Diode	AB	L203	VP-XF220K0000	J	Peaking 22μH	AB
	or				L204	RCiLi0632CEZZ	J	IF Coil	AE
	VHD1SS119//1								
D353	RH-EX0644GEZZ	J	Zener Diode, 13V	AB					

Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA358WEV0 (13N-M100B/150B)				
PWB-A: DUNTKA358WEV3 (CN13M10B)				
MAIN UNIT (Continued)				
L301	VP-XF150K0000	J	Peaking 15μH	AB
△ L701	RCiLF0078PEZZ	R	Coil	AF
	or			
	RCiLF0069PEZZ			
	or			
	RCiLF0037PEZZ			
	or			
	RCiLF0029PEZZ			
△ L702	RCiLF0090CEZZ	R	Coil (CN13M10B)	AL
△ L705	RCiLP0179CEZZ	J	Coil	AD
L2040	RCiLB0131CEZZ	J	Oscillation Coil	AE

TRANSFORMERS

△ T601	RTRNZ0731CEZZ	J	Transformer	AG
	or			
	RTRNZ0026PEZZ			
△△ T602	RTRNF0212PEZZ	R	H-Volt Transformer	AY
△ T702	RTRNW0004PEZZ	R	Transformer	AL
	or			
	RTRNW0008PEZZ			

CONTROL

△△ R738	RVR-M4628GEZZ	J	22k	AB
	or			
	RVR-M4336CEZZ			

CAPACITORS

[EL... Electrolytic, M-Poly... Metalized Polypro Film]

C51	VCEA0A1CW337M	J	330 16V EL.	AC
C53	VCEA0A1HW105M	J	1.0 50V EL.	AB
C54	VCEA0A1HW475M	J	4.7 50V EL.	AB
C101	VCEA0A1CW476M	J	47 16V EL.	AB
C201	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C202	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C203	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C204	VCQYTA1HM223K	J	0.022 50V Mylar	AB
C205	VCKYPA1HB103K	J	0.01 50V Ceramic	AA
C206	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C207	VCEA0A1CW476M	J	47 16V EL.	AB
C208	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C209	VCEA0A1HW105M	J	1.0 50V EL.	AB
C210	VCEA0A1HW474M	J	0.47 50V EL.	AB
C211	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C212	VCEA0A1HW474M	J	0.47 50V EL.	AB
C220	VCKYCY1CB104K	J	0.1 16V Ceramic	AB
C301	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C302	VCKYCY1HB102K	J	1000p 50V Ceramic	AA
C304	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C305	VCKYCY1HB103K	J	0.01 50V Ceramic	AA
C306	VCQYTA1HM103K	J	0.01 50V Mylar	AB
C354	VCEA0A1HW225M	J	2.2 50V EL.	AB
C356	VCKYCY1HB332K	J	3300p 50V Ceramic	AA
C357	VCEA0A1HW106M	J	10 50V EL.	AB
C358	VCEA0A1HW106M	J	10 50V EL.	AB
C361	VCEA0A1CW227M	J	220 16V EL.	AC
C401	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C411	VCEA0A1AW108M	J	1000 10V EL.	AC
C412	VCKYCY1HB103K	J	0.01 50V Ceramic	AA
C414	VCEA0A1HW225M	J	2.2 50V EL.	AB
C416	VCEA0A1HW105M	J	1.0 50V EL.	AB
C418	VCKYCY1HB103K	J	0.01 50V Ceramic	AA
C421	VCEA0A1HW106M	J	10 50V EL.	AB
C451	VCQYTA1HM563K	J	0.056 50V Mylar	AB
C454	VCEA0A1HW475M	J	4.7 50V EL.	AB
C456	VCEA0A1HW475M	J	4.7 50V EL.	AB
C509	VCKYPA2HB102K	J	1000p 500V Ceramic	AA
C510	VCEA0A1VW477M	J	470 35V EL.	AB
C512	VCFYSA1JB224J	J	0.22 63V Mylar	AD
C513	VCFYSA1JB473J	J	0.047 63V Mylar	AC
C514	VCEA0A1EW477M	J	470 25V EL.	AD
C515	VCEA0A1HW475M	J	4.7 50V EL.	AB

Ref. No.	Part No.	★	Description	Code
C516	VCKYCY1HB222K	J	2200p 50V Ceramic	AA
C517	VCEA0A1CW226M	J	22 16V EL.	AB
C520	VCEA0A1HW107M	J	100 50V EL.	AB
C530	VCFYFA1HA334J	J	0.33 50V Mylar	AB
C531	VCFYFA1HA564J	J	0.56 50V Mylar	AB
C606	VCKYPA2HB561K	J	560p 500V Ceramic	AA
C607	VCKYPA1HB472K	J	4700p 50V Ceramic	AA
△△ C610	VCFPVC3CA522H	J	5200p 1.6kV M-Poly.	AD
C612	VCFPB2EB334J	J	0.33 250V M-Poly.	AF
C633	VCEA0A1AW337M	J	330 10V EL.	AC
C634	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C635	VCEA0A1HW105M	J	1.0 50V EL.	AB
C636	VCQYTA1HM153K	J	0.015 50V Mylar	AA
C637	VCEA0A1CW476M	J	47 16V EL.	AB
C638	VCEA0A1AW477M	J	470 10V EL.	AC
C652	VCEA0A1HW475M	J	4.7 50V EL.	AB
C653	VCEA0A1HW105M	J	1.0 50V EL.	AB
C661	VCKYPA2HB152K	J	1500p 500V Ceramic	AA
C662	VCEA0A1CW477M	J	470 16V EL.	AC
△ C701	RC-FZ035SCEZZ	J	0.047 AC250V Plastic	AC
	or		(13N-M100B/150B)	
	RC-FZ004SGEZZ			
	or			
	RC-FZ015SCEZZ			
	or			
	RC-FZ027SCEZZ			
C702	RC-KZ0029CEZZ	J	0.01 AC250V Ceramic	AC
C703	RC-KZ0029CEZZ	J	0.01 AC250V Ceramic	AC
△ C705	RC-EZ1022CEZZ	J	470 200V EL.	AK
△ C706	RC-KZ0092GEZZ	J	0.0033 AC250V Ceramic	AC
	or			
	RC-KZ021SCEZZ			
	or			
	RC-KZ009SCEZZ			
	or			
	RC-KZ0106GEZZ			
	or			
	RC-KZ0156CEZZ			
△ C708	RC-FZ037SCEZZ	J	0.22 AC250V Plastic	AD
	or		(CN13M10B)	
	RC-FZ012SGEZZ			
	or			
	RC-FZ017SCEZZ			
	or			
	RC-FZ029SCEZZ			
C717	VCKYPA2HB472K	J	4700p 500V Ceramic	AB
△ C723	RC-EZ0638CEZZ	J	33 160V EL.	AG
△ C725	RC-EZ0724CEZZ	J	100 160V EL.	AG
C726	RC-KZ0338CEZZ	J	560p 2kV Ceramic	AD
C727	VCKYPA2HB472K	J	4700p 500V Ceramic	AB
△ C730	VCEA0A1CW108M	J	1000 16V EL.	AD
△ C731	VCEA0A1EW107M	J	100 25V EL.	AC
C732	VCKYPA1HF103Z	J	0.01 50V Ceramic	AA
C735	VCCCPA1HH680J	J	68p 50V Ceramic	AA
C737	VCEA0A1EW226M	J	22 25V EL.	AB
C738	RC-KZ0340CEZZ	J	820p 2kV Ceramic	AD
C739	VCEA0A1HW104M	J	0.1 50V EL.	AB
C740	VCEA0A1EW476M	J	47 25V EL.	AB
C743	RC-KZ0338CEZZ	J	560p 2kV Ceramic	AD
C750	VCKYPA1HF103Z	J	0.01 50V Ceramic	AA
C752	VCEA0A1CW476M	J	47 16V EL.	AB
C753	RC-KZ0338CEZZ	J	560p 2kV Ceramic	AD
			(13N-M100B/150B)	
C754	VCEA0A1CW476M	J	47 16V EL.	AB
C758	VCEA0A2EW106M	J	10 250V EL.	AD
C759	VCKYPA2HB102K	J	1000p 500V Ceramic	AA
C760	VCEA0A1CW108M	J	1000 16V EL.	AD
C771	VCEA0A1CW476M	J	47 16V EL.	AB
C772	VCEA0A1CW476M	J	47 16V EL.	AB
C783	VCQYTA1HM103K	J	0.01 50V Mylar	AB
C801	VCCCCY1HH180J	J	18p 50V Ceramic	AA
C807	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C808	VCEA0A1CW106M	J	10 16V EL.	AB
C811	VCKYCY1CB473K	J	0.047 16V Ceramic	AA
C812	VCEA0A1HW474M	J	0.47 50V EL.	AB

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA358WEV0 (13N-M100B/150B)									
PWB-A: DUNTKA358WEV3 (CN13M10B)									
MAIN UNIT (Continued)									
C901	VCEA0A1HW105M	J	1.0 50V EL.	AB	R513	VRD-RM2HD102J	J	1.0k 1/2W Carbon	AA
C905	VCEA0A1HW106M	J	10 50V EL.	AB	R514	VRD-RM2HD1R0J	J	1.0 1/2W Carbon	AA
C2001	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R515	VRS-VU3AE391J	J	390 1W M-Ox.	AB
C2002	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R516	VRN-MD2AL153J	J	15k 1/10W M-Film	AA
C2040	VCEA0A1AW107M	J	100 10V EL.	AB	R517	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
C2041	VCEA0A1HW105M	J	1.0 50V EL.	AB	R518	VRN-MD2AL333J	J	33k 1/10W M-Film	AA
C2060	VCKYCY1CB104K	J	0.1 16V Ceramic	AB	R519	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
C2061	VCKYCY1HB222K	J	2200p 50V Ceramic	AA	R520	VRD-RM2HD1R2J	J	1.2 1/2W Carbon	AA
C2062	VCEA0A1AW107M	J	100 10V EL.	AB	R522	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
C2201	VCKYCY1HB682K	J	6800p 50V Ceramic	AA	R523	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
C2601	VCEA0A1HW475M	J	4.7 50V EL.	AB	R525	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
C2602	VCCCCY1HH101J	J	100p 50V Ceramic	AA	R527	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
RESISTORS					R528	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
<i>[M-Ox... Metal Oxide, M-Film... Metal Film]</i>					R529	VRD-RA2BE472J	J	4.7k 1/8W Carbon	AA
RJ2	VRN-MD2AL000J	J	0 1/10W M-Film	AA	▲ R604	VRS-VU3LE562J	J	5.6k 3W M-Ox.	AC
RJ7	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R605	VRD-RA2BE121J	J	120 1/8W Carbon	AA
RJ8	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R606	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA
RJ9	VRN-MD2AL000J	J	0 1/10W M-Film	AA	▲ R608	VRS-VU3DE391J	J	390 2W M-Ox.	AB
RJ10	VRN-MD2AL000J	J	0 1/10W M-Film	AA	▲ R609	VRS-VU3AE562J	J	5.6k 1W M-Ox.	AK
RJ12	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R610	VRD-RM2HD220J	J	22 1/2W Carbon	AA
RJ18	VRN-MD2AL000J	J	0 1/10W M-Film	AA	▲ R611	VRS-KA3HG3R3K	J	3.3 5W M-Ox.	AD
RJ19	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R622	VRN-MD2AL222J	J	2.2k 1/10W M-Film	AA
RJ20	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R623	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
RJ21	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R624	VRN-RA2BK472F	J	4.7k 1/8W M-Film	AA
RJ26	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R634	VRD-RM2HD121J	J	120 1/2W Carbon	AA
▲ R53	VRS-VU3LE223J	J	22k 3W M-Ox.	AC	R635	VRN-MD2AL332J	J	3.3k 1/10W M-Film	AA
R54	VRN-MD2AL101J	J	100 1/10W M-Film	AA	R636	VRD-RA2EE221J	J	220 1/4W Carbon	AA
R55	VRN-MD2AL101J	J	100 1/10W M-Film	AA	▲ R641	VRS-VU3AE682J	J	6.8k 1W M-Ox.	AB
R56	VRN-MD2AL823J	J	82k 1/10W M-Film	AA	▲▲ R651	VRD-RM2HD270J	J	27 1/2W Carbon	AA
R57	VRD-RA2BE563J	J	56k 1/8W Carbon	AA	▲ R653	VRN-MD2AL000J	J	0 1/10W M-Film	AA
or					▲▲ R654	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
R101	VRD-RA2BE392J	J	1.5k 1/8W Carbon	AA	▲ R655	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R201	VRN-MD2AL221J	J	220 1/10W M-Film	AA	▲ R659	VRN-VV3AB1R5J	J	1.5 1W M-Film	AA
R202	VRN-MD2AL122J	J	1.2k 1/10W M-Film	AA	▲ R661	VRN-VV3ABR47J	J	0.47 1W M-Film	AA
R203	VRN-MD2AL682J	J	6.8k 1/10W M-Film	AA	▲▲ R662	VRD-RA2BE102G	J	1.0k 1/8W Carbon	AB
R204	VRN-MD2AL270J	J	27 1/10W M-Film	AA	▲ R702	RR-DZ0049CEZZ	J	3.9M 1/2W Carbon	AB
R205	VRD-RA2BE680J	J	68 1/8W Carbon	AA	or				
R206	VRD-RA2EE151J	J	150 1/4W Carbon	AA	▲ R703	VRW-KP3HC1R8K	J	1.8 5W Cement	AC
R207	VRD-RA2BE123J	J	12k 1/8W Carbon	AA	▲ R705	VRN-VV3ABR47J	J	0.47 1W M-Film	AA
R208	VRN-MD2AL332J	J	3.3k 1/10W M-Film	AA	▲ R706	VRN-VV3ABR47J	J	0.47 1W M-Film	AA
R209	VRN-MD2AL123J	J	12k 1/10W M-Film	AA	R707	VRD-RM2HD270J	J	27 1/2W Carbon	AA
R210	VRN-MD2AL104J	J	100k 1/10W M-Film	AA	R708	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
R211	VRN-MD2AL104J	J	100k 1/10W M-Film	AA	R710	VRS-SV2HC102J	J	1.0k 1/2W M-Ox.	AA
R212	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R711	VRN-MD2AL334J	J	330k 1/10W M-Film	AC
R215	VRN-MD2AL000J	J	0 1/10W M-Film	AA	R712	VRD-RA2BE100J	J	10 1/8W Carbon	AA
R220	VRN-MD2AL331J	J	330 1/10W M-Film	AA	R713	VRS-SV2HC122J	J	1.2k 1/2W M-Ox.	AA
R301	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA	R715	VRD-RA2BE150J	J	15 1/8W Carbon	AA
R302	VRN-MD2AL332J	J	3.3k 1/10W M-Film	AA	R716	VRS-VU3AE121J	J	120 1W M-Ox.	AB
R353	VRD-RA2BE683J	J	68k 1/8W Carbon	AA	R721	VRD-RM2HD124J	J	120k 1/2W Carbon	AA
R354	VRN-MD2AL103J	J	10k 1/10W M-Film	AA	R723	VRN-MD2AL000J	J	0 1/10W M-Film	AA
R355	VRD-RA2BE223J	J	22k 1/8W Carbon	AA	R725	VRS-SV2HC821J	J	820 1/2W M-Ox.	AA
R357	VRN-MD2AL822J	J	8.2k 1/10W M-Film	AA	▲▲ R733	VRD-RA2EE394J	J	390k 1/4W Carbon	AA
R401	VRN-MD2AL101J	J	100 1/10W M-Film	AA	▲▲ R736	VRD-RM2HD184J	J	180k 1/2W Carbon	AA
R402	VRN-MD2AL101J	J	100 1/10W M-Film	AA	R739	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R403	VRN-MD2AL101J	J	100 1/10W M-Film	AA	R740	VRD-RM2HD470J	J	47 1/2W Carbon	AA
R404	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA	▲▲ R741	VRD-RM2HD682J	J	6.8k 1/2W Carbon	AA
R411	VRN-MD2AL684J	J	680k 1/10W M-Film	AA	R751	VRD-RA2BE821J	J	820 1/8W Carbon	AA
R412	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA	R752	VRD-RA2BE562J	J	5.6k 1/8W Carbon	AA
R413	VRN-MD2AL152J	J	1.5k 1/10W M-Film	AA	R755	VRD-RM2HD151J	J	150 1/2W Carbon	AA
R414	VRN-MD2AL000J	J	0 1/10W M-Film	AA	▲ R758	VRS-SV2HC150J	J	15 1/2W M-Ox.	AA
R421	VRN-MD2AL223J	J	22k 1/10W M-Film	AA	▲ R773	VRS-VU3LE270J	J	27 3W M-Ox.	AC
▲ R451	VRS-SV2HC103J	J	10k 1/2W M-Ox.	AA	▲ R774	VRS-VU3LE680J	J	68 3W M-Ox.	AC
R453	VRD-RA2BE152J	J	1.5k 1/8W Carbon	AA	R801	VRD-RM2HD470J	J	47 1/2W Carbon	AA
R454	VRD-RA2EE224J	J	220k 1/4W Carbon	AA	R807	VRN-MD2AL272J	J	2.7k 1/10W M-Film	AA
R455	VRD-RA2BE392J	J	3.9k 1/8W Carbon	AA	R808	VRN-MD2AL272J	J	2.7k 1/10W M-Film	AA
R456	VRN-MD2AL103J	J	10k 1/10W M-Film	AA	R809	VRN-MD2AL223J	J	22k 1/10W M-Film	AA
R457	VRD-RA2BE102J	J	1.0k 1/8W Carbon	AA	R810	VRN-MD2AL223J	J	22k 1/10W M-Film	AA
R461	VRN-MD2AL184J	J	180k 1/10W M-Film	AA	R901	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R462	VRN-MD2AL273J	J	27k 1/10W M-Film	AA	R902	VRN-MD2AL750J	J	75 1/10W M-Film	AA
R512	VRD-RM2HD102J	J	1.0k 1/2W Carbon	AA	R906	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
					R925	VRN-MD2AL104J	J	100k 1/10W M-Film	AA
					R961	VRN-MD2AL101J	J	100 1/10W M-Film	AA
					R962	VRN-MD2AL101J	J	100 1/10W M-Film	AA
					R2001	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
					R2002	VRN-MD2AL103J	J	10k 1/10W M-Film	AA

Ref. No.	Part No.	★	Description	Code
PWB-A: DUNTKA358WEV0 (13N-M100B/150B)				
PWB-A: DUNTKA358WEV3 (CN13M10B)				
MAIN UNIT (Continued)				
R2006	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2008	VRN-MD2AL333J	J	33k 1/10W M-Film	AA
R2009	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
R2010	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
R2012	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2014	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
			(CN13M10B)	
R2016	VRN-MD2AL223J	J	22k 1/10W M-Film	AA
R2018	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
			(13N-M100B/150B)	
R2020	VRN-MD2AL223J	J	22k 1/10W M-Film	AA
R2022	VRN-MD2AL333J	J	33k 1/10W M-Film	AA
R2023	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R2024	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R2025	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R2026	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R2027	VRD-RA2BE682J	J	6.8k 1/8W Carbon	AA
R2028	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
R2029	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2032	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R2033	VRN-MD2AL684J	J	680k 1/10W M-Film	AA
R2034	VRN-MD2AL684J	J	680k 1/10W M-Film	AA
R2040	VRN-MD2AL102J	J	1.0k 1/10W M-Film	AA
R2041	VRN-MD2AL333J	J	33k 1/10W M-Film	AA
R2042	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R2043	VRD-RA2BE101J	J	100 1/8W Carbon	AB
R2044	VRN-MD2AL683J	J	68k 1/10W M-Film	AA
R2045	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2047	VRN-MD2AL221J	J	220 1/10W M-Film	AA
R2048	VRN-MD2AL562J	J	5.6k 1/10W M-Film	AA
R2049	VRN-MD2AL333J	J	33k 1/10W M-Film	AA
R2060	VRN-MD2AL221J	J	220 1/10W M-Film	AA
R2061	VRN-MD2AL562J	J	5.6k 1/10W M-Film	AA
R2062	VRN-MD2AL183J	J	18k 1/10W M-Film	AA
R2063	VRN-MD2AL222J	J	2.2k 1/10W M-Film	AA
R2065	VRN-MD2AL000J	J	0 1/10W M-Film	AA
R2066	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2067	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2068	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2070	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2072	VRN-MD2AL103J	J	10k 1/10W M-Film	AA
R2101	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2102	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2201	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R2202	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R2203	VRN-MD2AL332J	J	3.3k 1/10W M-Film	AA
R2211	VRD-RA2BE222J	J	2.2k 1/8W Carbon	AA
R2212	VRN-MD2AL682J	J	6.8k 1/10W M-Film	AA
R2213	VRD-RA2BE223J	J	22k 1/8W Carbon	AA
R2401	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2402	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2403	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2404	VRN-MD2AL101J	J	100 1/10W M-Film	AA
R2501	VRN-MD2AL123J	J	12k 1/10W M-Film	AA
R2503	VRN-MD2AL273J	J	27k 1/10W M-Film	AA
R2504	VRN-MD2AL123J	J	12k 1/10W M-Film	AA
R2505	VRN-MD2AL563J	J	56k 1/10W M-Film	AA
R2506	VRN-MD2AL563J	J	56k 1/10W M-Film	AA
R2507	VRN-MD2AL823J	J	82k 1/10W M-Film	AA
R2508	VRN-MD2AL153J	J	15k 1/10W M-Film	AA
R2509	VRN-MD2AL272J	J	2.7k 1/10W M-Film	AA
R2601	VRD-RA2BE331J	J	330 1/8W Carbon	AA

SWITCHES

S2501	QSW-K0202PEZZ	R	Power	AC
	or			
	QSW-K0079GEZZ			
S2502	QSW-K0202PEZZ	R	VOL-Down	AC
	or			
	QSW-K0079GEZZ			
S2503	QSW-K0202PEZZ	R	VOL-Up	AC

Ref. No.	Part No.	★	Description	Code
	or			
S2504	QSW-K0079GEZZ			
S2504	QSW-K0202PEZZ	R	CH-Down	AC
	or			
	QSW-K0079GEZZ			
S2505	QSW-K0202PEZZ	R	CH-Up	AC
	or			
	QSW-K0079GEZZ			
MISCELLANEOUS PARTS				
△ F701	QFS-B4023CEZZ	J	Fuse 4A (125V)	AC
	or			
	QFS-B4021GEZZ			
FH701	QFSHD1013CEZZ	J	Fuse Holder	AC
FH702	QFSHD1014CEZZ	J	Fuse Holder	AC
FB351	RBLN-0047CEZZ	J	Ferrite Bead	AB
FB601	RBLN-0047CEZZ	J	Ferrite Bead	AB
FB2002	RBLN-0037CEZZ	J	Ferrite Bead	AB
J903	QJAKE0205CE09	J	Jack, Audio IN	AD
	or			
	QJAKE0159CEZZ			
J905	QJAKE0205CE04	J	Jack, Video IN	AD
	or			
	QJAKE0158CEZZ			
P302	QPLGN0261CEZZ	J	Plug, 2-pin (S)	AB
P401	QPLGN0561CEZZ	J	Plug, 5-pin (GBN)	AB
P601	QPLGN0660CEZZ	J	Plug, 6-pin (K)	AC
P651	QPLGN0361CEZZ	J	Plug, 3-pin (TP651-3)	AB
P701	QPLGN0260CEZZ	J	Plug, 2-pin (M)	AC
P751	QPLGN0461CEZZ	J	Plug, 4-pin (YBN)	AB
P2001	QPLGN0561CEZZ	J	Plug, 5-pin (TP2001-5)	AB
RMC2601	RRMCU0232CEZZ	J	R/C Receiver	AG
	or			
	RRMCU0252CEZZ			
RDA501	PRDAR0297PEFW	R	Heat Sink, for IC501	AD
RDA701	PRDAR0026PEFW	R	Heat Sink, for Q701	AD
	LX-BZ3100CEFD	J	Screw	AA

Ref. No.	Part No.	★	Description	Code
PWB-B: DUNTKA359WEV0 (13N-M100B/150B)				
PWB-B: DUNTKA359WEV3 (CN13M10B)				
CRT UNIT				
TRANSISTORS				
Q852	VSBF422////-1	J	BF422	AC
	or			
Q854	VS2SC2229O/1E	J	BF422	AC
	or			
Q856	VSBF422////-1	J	BF422	AC
	or			
Q881	VS2SC2229O/1E	J	A1266(Y)	AA
	or			
	VS2SA1015-Y-1			
DIODES				
D882	RH-DX0475CEZZ	J	Diode	AB
D885	RH-DX0475CEZZ	J	Diode	AB
COIL				
L852	VP-MK820K0000	J	Peaking 82μH	AB
CAPACITORS				
<i>[EL.... Electrolytic]</i>				
C851	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C852	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C853	VCCSPA1HL151J	J	150p 50V Ceramic	AA
C854	RC-KZ0029CEZZ	J	0.01 250V Ceramic	AC
	or			
	RC-KZ0160GEZZ			
C881	VCEA0A1CW106M	J	10 16V EL.	AB
C883	VCEA0A1CW336M	J	33 16V EL.	AB
RESISTORS				
<i>[M-Ox.... Metal Oxide, M-Film... Metal Film]</i>				
R852	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R853	VRN-MD2AL121J	J	120 1/10W M-Film	AA
△ R857	VRS-VU3AE123J	J	12k 1W M-Ox.	AB
R858	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R860	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R861	VRN-MD2AL121J	J	120 1/10W M-Film	AA
△ R865	VRS-VU3AE123J	J	12k 1W M-Ox.	AB
R866	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R867	VRN-MD2AL470J	J	47 1/10W M-Film	AA
R868	VRN-MD2AL221J	J	220 1/10W M-Film	AA
R869	VRN-MD2AL121J	J	120 1/10W M-Film	AA
△ R873	VRS-VU3AE123J	J	12k 1W M-Ox.	AB
R874	VRD-RM2HD332J	J	3.3k 1/2W Carbon	AA
R881	VRN-MD2AL561J	J	560 1/10W M-Film	AA
R882	VRN-MD2AL391J	J	390 1/10W M-Film	AA
R883	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R884	VRN-MD2AL152J	J	1.5k 1/10W M-Film	AA
R886	VRN-MD2AL821J	J	820 1/10W M-Film	AA
R887	VRD-RA2BE470J	J	47 1/8W Carbon	AA
R890	VRN-MD2AL470J	J	47 1/10W M-Film	AA
R891	VRN-MD2AL470J	J	47 1/10W M-Film	AA
MISCELLANEOUS PARTS				
P851	QPLGN0561CEZZ	J	Plug, 5-pin (GBN)	AB
P852	QPLGN0461CEZZ	J	Plug, 4-pin (YBN)	AB
SC852	QSOCV0839CEZZ	J	CRT Socket	AK
	or			
	QSOCV0842CEZZ			

Ref. No.	Part No.	★	Description	Code
MISCELLANEOUS PARTS				
△ ACC701	QACCD3090CESA	J	AC Cord	AK
	or		(13N-M100B, CN13M10B)	
	QACCD3064CESA			
	or			
	QACCD3060CESA			
△ ACC701	QACCD3060CESB	J	AC Cord (13N-M150B)	AR
SP1	VSP0080PBP8YA	R	Speaker, 32ohm	AK
	or			
	VSP0080PBQ3YA			
	QCNW-2105PEZZ	R	Connecting Cord	AF
	QCNW-2106PEZZ	R	Connecting Cord	AE
	QCNW-2107PEZZ	R	Connecting Cord	AE

SUPPLIED ACCESSORIES				
RRMCG1324CESA	J	Infrared R/C Unit (13N-M100B, CN13M10B)	AT	
RRMCG1324CESB	J	Infrared R/C Unit (13N-M150B)	AT	
TiNS-7209PEZZ	R	Operation Manual (13N-M100B/150B)	AE	
TiNS-7238PEZZ	R	Operation Manual (CN13M10B)		

Ref. No.	Part No.	★	Description	Code
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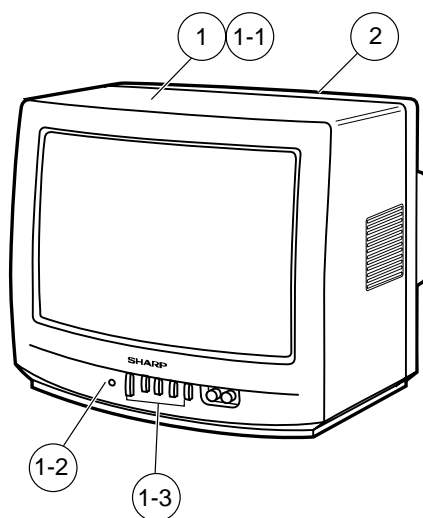
PACKING PARTS

(NOT REPLACEMENT ITEM)

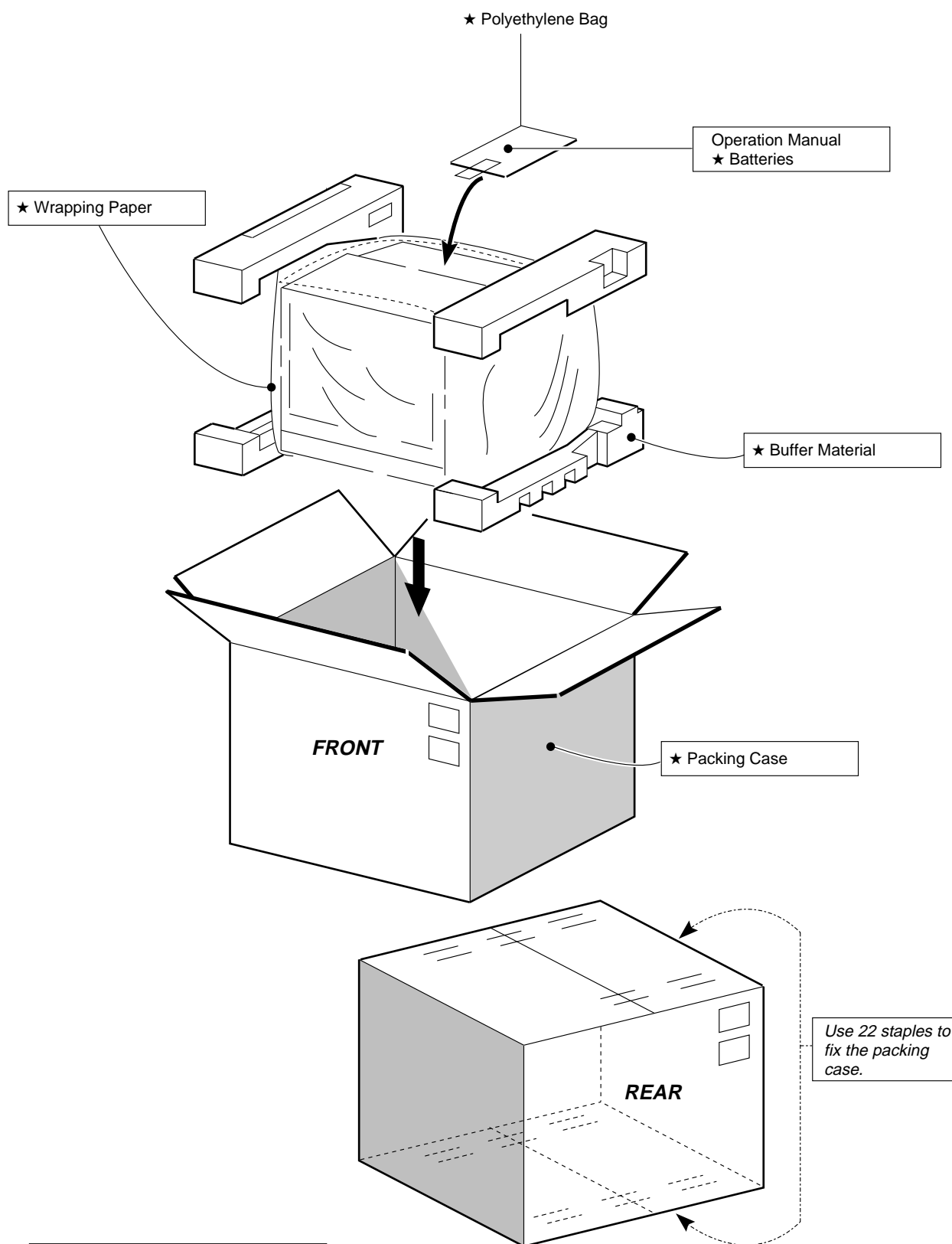
SPAKC6619PEZZ	—	Packing Case (13N-M100B)	—
SPAKC6620PEZZ	—	Packing Case (13N-M150B)	—
SPAKC6633PEZZ	—	Packing Case (CN13M10B)	—
SPAKP0031PEZZ	—	Wrapping Paper	—
SPAKP0110PEZZ	—	Wrapping Paper	—
SPAKX2630PEZZ	—	Buffer Material	—
SSAKA0001PEZZ	—	Polyethylene Bag	—

CABINET PARTS

1	CCABA2552WEV0	R	Front Cabinet Ass'y (13N-M100B)	AX
1	CCABA2552WEV2	R	Front Cabinet Ass'y (13N-M150B)	AX
1	CCABA2566WEV0	R	Front Cabinet Ass'y (CN13M10B)	AZ
1-1	Not Available	—	Front Cabinet	—
1-2	GCOVA0078PEKA	R	R/C Cover	AD
1-3	JBTN-0306PESA	R	Button (13N-M100B, CN13M10B)	AD
1-3	JBTN-0306PESB	R	Button (13N-M150B)	AD
2	CCABB2309WEV0	R	Rear Cabinet (13N-M100B)	AW
2	CCABB2309WEV1	R	Rear Cabinet (13N-M150B)	AW
2	CCABB2325WEV0	R	Rear Cabinet (CN13M10B)	AW



PACKING OF THE SET



★ **MARK** : Not replacement items.

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